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AUTHOR Chase, Clinton I.; Pugh, Richard C.
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INSTITUTION Indiana Univ., Bloomington.
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ABSTRACT

The question discussed in this paper is: if middle class children and lower class children were matched on the basis of scores on an intelligence test, would one social class group achieve its scores on a different item set than would the other social class group? This study was first carried out on data collected in the Fall, 1967 and replicated in the Fall, 1968. Children in grades four through six, classified into social class groupings according to their fathers' occupations, were given the Otis Quick Scoring Mental Abilities Test. A total of 300 students were matched. The second study differed by classifying fathers' jobs according to the Dictionary of Occupation Studies, rather than according to Warner's classification. A total of 320 children were matched. Results of both studies showed that children from the middle class did not get their scores on the intelligence test by responding to items in a different set than did the matched group from the lower class. (KJ)

Social Class and Performance on an Intelligence Test

Clinton I. Chase
Richard C. Pugh

INDIANA UNIVERSITY

Introduction. The language models to which lower class children are exposed are typically meager, restricted, and incorrect grammatically by middle class standards. This fact would suggest that a lower class child's use of language in divergent and elaborative thinking, and indeed in the manipulation and communication of any abstraction, would be quite different from a middle class child's use of language.

Since group intelligence tests typically require considerable verbal ability, social class has been consistently shown to be related to performance on these instruments. Middle class children, with their advanced verbal skills, produce the higher mean scores although a notable overlap does occur in distributions. It might be hypothesized that even if two children, one from the middle class and one from the lower class, have identical total scores on an intelligence test they do not use the same test items to acquire those scores due to differences in their manipulation of verbal symbols.

The evidence is abundant that lower class children have different verbal abilities than the more advantaged children have. Newton (1959) comparing good and poor readers, found definite social class differences between parents of children in his two reading groups. Bernstein (1960) found that intellectual development of middle class children was a function of their

greater linguistic ability. Cohn (1959) indeed concluded that lower class language was a separate dialect from middle class language. Deutch (1963) further noted that the differences between lower and middle class language abilities increased with age.

There is some evidence that lower class children are not as handicapped in all intellectual functions as they are in verbal skills. For example, Deutch (1960) found arithmetic skills for lower class children to be ahead of verbal skills. Deutch (1963) also noted that in perceptual skills lower class children gained on middle class children with age.

The above studies appear to support the following conclusions:

1. Lower class children are clearly different in language skills from more advantaged children.
2. The deficit of the lower class may not be as great in some areas, possibly perceptual and number skills, as in the verbal area.

If these conclusions are true, they should have some generalizability to how children from the middle class, and from the lower class, respond to items on an intelligence test. If the total performance of two children is the same, i.e., if total test scores are matched for two groups of children, it is hypothesized that the child from the middle class, with his advantage in language, will have achieved this score in a different manner than did his matched partner from the lower class. In other words, it is hypothesized

that the middle class child would have achieved his score, at least in part, on a different item set than did the matched lower class child.

The problem, then, was: If middle class children are matched with lower class children on total scores on an intelligence test, does one social class group achieve its scores on a different item set than does the other social class group?

Procedure. This study was first carried out on data collected in the fall of 1967, and replicated in the fall of 1968. The 1967 study will be described first.

Children in the fourth, fifth and sixth grades in three different elementary schools in a small city system were routinely administered the Otis Quick Scoring Mental Abilities Test, Level Beta, Form EM. School officials were asked to classify each child into social class groupings based on the occupation of each child's father. The descriptions of categories broadly followed the Warner et. al. (1949) classification. Since Warner found occupation to correlate substantially with social class it was believed that this basis for classification was satisfactory. Then children from parents in the professional-entrepenuer category were matched on total Otis raw score with children from parents in the labor category. Matching was kept within a range of three raw score points, within sex, grade and classrooms. From a total of 300 children 78 (or 39 pairs) were

matched. Twenty-one in the lower class were left without a matched partner.

The differences between social classes in test item patterns were analysed by analysis of variance. Items were scored 1.25 if correct, .25 if left blank, and .00 if erroneously marked. This was equivalent to scoring with a formula for a five option multiple choice test, and would show possible differences in the patterns due to failing items as well as skipping items, or in failing to reach items at the end of the test. A three way analysis of variance was employed--social class by matched pairs by items--to provide the statistical analysis.

A review of the procedure led to the speculation that the results might be influenced by a lack of precision in the classification of occupations of the children's fathers; therefore, the study was cross-validated in 1968 on a second group of fourth, fifth and sixth grade pupils. This time occupations of fathers were classified following the ten levels described in the Dictionary of Occupational Titles. In this study the alternate Otis form, FM, was administered to the students. Matches were then made between children whose fathers were in DOT top category, and those in lowest three categories. As before matches were made within sex, grade, and classroom. From a total sample of 320 children 49 pairs, or 98 children, were matched in this manner. Three of the matches were within sex and grade but were not within the

same classroom. Eighteen lower class children failed to find a match.

As before items were scored 1.25 if correct, .25 if blank, and .00 if incorrect. Analysis of variance was applied to the data in a three way design--social class by matched pairs by items.

Results. The results of the first study are reported in Table 1. The line in the table which is most relevant to the problem is line 5, the social class Groups-Items interaction. If one socio-economic group gets its scores on a different set of items than the other socio-economic group, a significant Groups-Items interaction should result. With the scoring procedure used, this also should be true if one group left blank in large numbers different items than did the other group.

As can be seen from Table 1 the social class Groups-Items interaction does not approach significance. It is therefore concluded that children from the middle class did not get their scores on the intelligence test by responding to items in a different set than did the matched group from the lower class.

The results from the replication of the study are reported in Table 2. Again the social class Groups-Items interaction is the important line in the analysis. As in the previous data this test produced an insignificant finding.

If the tests were either too difficult or too easy for the children in this study we might expect these findings to be due to all students missing all items, or all students

getting all items correct. The data in Table 3 show that the mean performance on the test for each social class group is just below half of the possible score of 80. The test does not appear to be either too easy or too difficult for the students involved, leaving a fair latitude for group differences to appear if present.

The data appear to indicate that children from the lower socio-economic class get their scores on essentially the same items as matched children from the middle class. However, the data do not say that there are no class differences in cognitive functions. They merely suggest that typically a child from the lower class, in getting score X, successfully performed the same tasks as a child from the middle class who got the same score. However, disparities in verbal ability between classes would not suggest this to be true. One may also argue that only the few lower class children who happen to have middle class verbal skills were used in this study. This is probably not true, since in both studies the majority of lower class children in the samples were used as subjects.

Conclusion. Noting the wide differences in verbal abilities of middle and lower class children, the investigators proposed that two groups of children, one from the lower class, one from the middle class, who achieve comparable total scores on a group intelligence test would get their scores by successfully completing different sets of items. The data in this cross validated study do not support this hypothesis.

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SOCIAL CLASS AND PERFORMANCE ON AN INTELLIGENCE TEST

Clinton I. Chase and Richard C. Pugh
INDIANA UNIVERSITY

Table 1. The Analysis of Variance for the Initial Study: Social Class by Subjects by Items

	Variable	ss	df	ms	F
1.	Social Class	0.0004	1	0.0004	
2.	Subjects	135.0107	38	3.5529	
3.	Items	558.4471	79	7.0690	
4.	1 x 2	5.2707	38	.1387	
5.	1 x 3	13.2064	79	.1672	.770 n.s.
6.	2 x 3	722.2537	3002	.2406	
7.	1 x 2 x 3	651.7725	3002	.2171	

Table 2. The Analysis of Variance for the Cross Validation Study: Social Class by Subjects by Items

	Variable	ss	df	ms	F
1.	Social Class	.1299	1	.1299	
2.	Subjects	167.9822	46	3.6518	
3.	Items	652.1392	79	8.2549	
4.	1 x 2	9.0932	46	.1977	
5.	1 x 3	18.5144	79	.2344	.984 n.s.
6.	2 x 3	912.3502	3634	.2511	
7.	1 x 2 x 3	865.2313	3634	.2381	

Table 3. Descriptive Data on Raw Scores (Using Formula for Guessing) for the Two Studies.

	Group	$\bar{X}$	S
Initial Study	middle	28.49	11.49
	lower	28.16	11.80
Cross-Validation	middle	29.83	11.90
	lower	29.29	12.39